

CARDIAC SURGERY AND REHABILITATION

There are two important branches of the heart field that I would like to talk about for a few minutes this evening. One is the exciting field of heart research, and specifically, cardiac surgery. The other is the somewhat little known but equally important job of cardiac rehabilitation. My own interest in heart research and surgery centers around the National Heart Institute, an organization for which I have a special responsibility as a legislator and congressional appropriations subcommittee chairman. And I hope to focus your attention briefly on some of the problems of cardiac rehabilitation that we face here in our own State of Rhode Island. As research in heart disease advances, and more lives are saved, rehabilitation problems are obviously going to increase, unless the field gets the share of attention it deserves.

The National Heart Institute is, as you may know, a division of the National Institutes of Health, which constitute the research arm of the U. S. Public Health Service. It is concerned mostly with research and training in cardiovascular disease, and with the control of heart disease in the States. Created by act of Congress in the summer of 1948, the Institute has grown, at a roughly parallel rate, with the American Heart Association, which, as you recall, assumed its present character as a national voluntary health agency in that same year. Operating at a current appropriation level of approximately \$45 million, the Heart Institute is the largest source of support for cardiovascular research and training in the country. About one sixth of its appropriation this year is being devoted to research conducted in its own laboratories; a little over half is being awarded in research grants

to scientists in medical schools, hospitals and other institutions throughout the country. I think it is quite accurate to say that the Institute has helped make possible a major share of the progress in cardiovascular research that we have seen over the past ten years.

You are all probably more up-to-date and knowledgeable than I on the details of the latest advances in cardiac surgery. I would like, however, to touch upon some of the recent work that has been done by the Heart Institute and through its research program, to give you an idea of its scope.

Using a technique perfected in the Heart Institute known as "trans-bronchial puncture," catheterization of the left side of the heart has proved to be a safe and extremely valuable way of diagnosing several types of heart flaws. Until quite recently, only the chambers of the right side of the heart could safely be reached with catheter tubes; now all four chambers can be studied. With this new technique, a slender tubular instrument called a bronchoscope is introduced down the throat to the junction of the two main branches of the windpipe. A two-chambered needle connected by a hollow tube to a pressure-recording device is inserted down the bronchoscope and a puncture made just to the left of this dividing point, below which lies the heart's left atrium. A flexible plastic catheter tube is then slid through the needle into either the left atrium or on through the mitral valve into the left ventricle. Through this catheter, pressures may be measured, dye injected, and blood samples drawn to provide data important in the diagnosis of defective valves or holes in the heart's dividing partitions. Since 1954, the technique has been used successfully in more than 800 patients in the Heart Institute's Clinic of Surgery.

The Heart Institute has helped to develop and refine the low-temperature surgical technique known as hypothermia. In some types of heart surgery it is necessary to interrupt blood circulation briefly. Brain cell damage, however, occurs, if the interruption is more than very brief--at normal body temperatures. If the body is cooled to around 80 - 85F., body metabolism slows down and the circulation can be interrupted longer. This gives the heart surgeon 6 to 8 minutes of working time without the danger of brain damage. Many operations which would formerly have been either impossible or very dangerous have been performed with this now widely used method.

A number of ways of pumping and oxygenating blood during heart surgery have been developed through the Institute's research program. At first, cross-circulation techniques were tried using donors; also mechanical pumps with animal lung lobes were used in combination; now several all-mechanical devices have been developed. One of these, a mechanical pump combined with a simple, inexpensive oxygenating apparatus, has been successfully used in many within-the-heart operations, including the repair of several kinds of congenital defects.

An outstanding recent advance in heart surgery was a technique by which the heart's aortic valve can be repaired more safely and effectively. The method supplies blood to the heart muscle during operations without using the normal coronary artery supply lines. Because the two openings, or "ostia," through which the coronary arteries receive their blood, are located right at the aortic valve--in the bases of its leaflets--the hazard of baring them

to the air has challenged past attempts to repair the valve. Exposing these openings would admit air bubbles to the coronary circulation resulting in heart damage and death. Using the new technique, called "retroperfusion of the coronary sinus," developed experimentally in Heart Institute-supported animal studies, the valve can be exposed without the danger of trapped air bubbles. The need of the heart muscle for oxygen is satisfied by pumping blood "in reverse" into the coronary sinus, the vein that normally drains the heart muscle.

N.I.H. research surgeons have devised an operation that prevents the heart failure and death that have previously resulted from rupture into the heart of a weak spot, or aneurysm, at the base of the aorta. The new procedure is called the "golf tee operation" because a tee-shaped device of plastic sponge is used to plug the rupture. Patients, heretofore doomed to progressive heart failure without the operation, have been freed of all symptoms and are now leading fully active lives.

These are just a few illustrations of life-saving advances being made by surgeons in a large heart research establishment. I am sure I don't need to go farther than to say that this kind of work is going on all over the United States; that it is battering at the gates of ignorance standing between us and knowledge of the major heart diseases, and that the entire endeavor is on a scale that would have seemed unbelievable as recently as ten years ago.

To me it is a very dramatic story, but as you know, the show is far from over when the patient leaves his bed and goes home. The physician's immediate

responsibility toward him is less, to be sure; but then the patient becomes a community responsibility, and, if neglected, sometimes a community charge. In most cases, there is a big job of rehabilitation to be done. Unfortunately in many instances it is not being done well enough.

Of all the disabling conditions which face us today, one of the foremost - both in numbers and in the potentials for successful rehabilitation - is the recovered cardiovascular patient. Hemiplegia resulting from stroke is probably the most familiar sight in any rehabilitation center, or hospital rehabilitation department, in this country today.

The percent of stroke victims who cannot benefit substantially from proper and complete rehabilitation services is small. It keeps getting smaller as we (1) acquire more medical knowledge about heart and circulatory conditions (2) develop more refined methods of retraining paralyzed and atrophied muscles, and the other phases of a modern program of daily living essentials, and (3) as we replace fear with understanding and confidence.

At present, the public program of vocational rehabilitation rehabilitates more than 600 persons each year who have suffered vascular accidents of one form or another. Other hundreds are served by voluntary agencies.

Unfortunately, too many stroke victims still do not receive modern rehabilitation services until long periods have elapsed after the attack so that secondary problems of atrophy, of psychological attitudes, and other sequelae make full recovery more difficult.

I think it might be very helpful to us this evening to take a brief look at the cardiac rehabilitation situation here in Rhode Island. It is a great deal better than it used to be, but there are certainly some serious gaps.

We have two agencies within the structure of our State government, whose services include help in rehabilitating cardiac patients. They are the Division of Vocational Rehabilitation in the Department of Education, and the Rheumatic Fever Program in the Maternal and Child Health Division of the State Health Department.

The Division of Vocational Rehabilitation, whose funds are matched by the Federal Government, will pay for heart surgery in indigent cases, and they, of course, are set up to re-train people who are forced to change their occupations. They have about a dozen vocational counsellors, who, though they are doing an excellent job, could substantially improve their services to cardiac patients if a way of giving them more training in this field could be found.

Another problem in the Division of Vocational Rehabilitation arises because of certain outmoded legal restrictions. For example, they are permitted by law to buy tools for an indigent, rehabilitated carpenter who is ready to go back to work. But they are prevented by law from getting him an automobile of any kind. If he has been out of work a long time obviously he can't get one himself, and just as obviously he can't work without one.

Although a usable car would probably cost less than a good set of carpenter's tools at today's prices, and would put him back in business as a self-supporting citizen, the Division cannot even help get him one because of this no-longer-sensible law. This is only one example; the whole spectrum of laws involving vocational rehabilitation, and I might add parenthetically, workmen's compensation laws, should be given a thorough and intelligent review in the light of changing times and conditions.

The other part of the State government involved in cardiac rehabilitation is the Rheumatic Fever program of the Department of Health. It is set up and operates chiefly for those who are medically indigent. However, it provides complete medical care for any rheumatic fever patient under 21. They have a social worker, one of whose duties is that of vocational counsellor, and efforts are made to steer them into occupations in line with the limitations imposed by their handicaps. I am told, however, that this is not being done nearly enough in the schools--or rather that vocational counselling in the schools is not adequate in handling these cases. So here is another area where some of our workers could serve better if they had more training. Possibly the solution lies in evening or summer training courses. In any case I think we should give it serious thought.

There is, I am happy to say, some excellent work being done outside the governmental structure. Our larger hospitals all have medical social workers who devote a good part of their time to vocational rehabilitation, and some part of it, of course, to cardiac rehabilitation. The Division of

Vocational Rehabilitation has lent the Rhode Island Hospital a vocational counsellor, who began the assignment in August of this year. I was particularly pleased to learn too, that the Rhode Island Hospital has a social worker who specializes in cardiovascular disease.

But the most promising work that is being done "on the outside" is that of the Rhode Island Heart Association.

In the field of cardiac rehabilitation, there are two problems that loom so large as to make all the others seem trivial by comparison. One is employer prejudice. All too often, it seems to me, businessmen feel that it's too great a risk to hire one who has had a cardiac problem. We simply must overcome this attitude. For it is wasteful of our manpower and it assigns too many of our finest talents, to the street of broken dreams. The other problem really is an outgrowth of the first. I think we must determine, on a matter-of-fact, scientific basis, the capacity of a cardiac patient, in the light of his particular job demands. Cardiac reserve has been compared with a bank account whose balance we don't know. Not until we have "bounced" a check do we discover where the limit is; so in rehabilitation as in banking, guessing can be a little dangerous. The Rhode Island Heart Association is tackling this "bank account" problem, and I believe success with this will go a long way toward overcoming the other problems-that of employer prejudice.

The Association has, as you of course well know, a rehabilitation committee, half of which are physicians, with the other half representing labor, management and the legal profession. This committee is now proceeding to establish a "cardiac work evaluation unit," on a pilot basis, and they are receiving the fullest measure of cooperation from the Vocational Rehabilitation Division.

The unit itself, working along guide-lines suggested by the American Heart Association, will consist of a social worker, a vocational counsellor and a physician, and will give to cardiac rehabilitation a vital element it has not had: namely, a team approach. Doughten Cramer tells me that he has high hopes for the success of this idea.

Another group here that I hope will develop a special interest in cardiac rehabilitation is the Community Council's Committee on the Chronically Ill. Perspective is always of great value in approaching a challenging problem, and it is something that individuals and individual agencies often lack. The Committee, and the Council itself might provide a common meeting ground, and lend a great measure of strength to overall planning.

And now I have taken as much time as any after-dinner speaker has any conceivable right to. I have mentioned a little of the work of the National Heart Institute, which has become very much a part of the ^{total} national effort to overcome our most serious disease problem; and I have talked a little about our cardiac rehabilitation efforts and needs here at home. Cardiovascular research offers the exciting prospect of saving, in the next few years, many thousands of lives. It can be equally exciting to help restore some of these people to useful citizenship.